

Re: KKT constraint preconditioner

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- *From:* laverneth@xxxxxxxxxxxx
 - *Date:* Wed, 23 Apr 2008 07:39:30 -0700 (PDT)
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On Apr 23, 4:11 pm, toni.lass...@xxxxxxxx (Toni Lassila) wrote:

On Wed, 23 Apr 2008 06:31:08 -0700 (PDT), lavern...@xxxxxxxx wrote:

I want to solve a full KKT system of the form
[A C]
[CT 0]
with A is a n,n matrix, and C is a n,m matrix representing m
constraints on the n primal variables,
and CT is its transpose.

I am trying to solve this method with an iterative method (namely BiCGSTAB), and thus I need a good preconditioner. Often, the constraint preconditioner is described in the literature and I tried to implement it. It involves approximate solves with the m,m system $CT * C$. I tried to use a SAINV factorization on that system which has the great advantage to avoid forming the matrix $CT * C$ explicitly (see 1) for reference).

However, in my case C has not full column rank and $C^t * C$ is therefore indefinite and SAINV factorization breaks down because of exactly zero pivots. Has anyone an idea to avoid such zero pivots in the factorization ? Should I use an other factorization ?

Why do you have linearly dependent constraints?

I have intersecting interfaces with constraints on dofs on each side of those interfaces (sliding contact for instance)
Thus at the location where those interfaces cross, some constraints are linearly dependant from other.
At first sight, considering the way I impose constraints in my models, it seems complicated to avoid such redundancy.

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